Supplementary Information: linear mixed model

Let Y_{ti} being the YBOCS of Subject i (1…i…N) on time t (t=1…t…Ti) (with Ti the number of repeated observations of Subject i), Next, M_{ti} indicating the months passed since surgery for Subject i at assessment t, $M_{ti}{}^2$ a quadratic term for M_{ti}, S_{ti} is a binary variable indicating whether stimulation is on (S_{ti}=1) or off (S_{ti}=0), and O_{ti} is a binary variable indicating whether surgery took place (O_{ti}=1) or not (O_{ti}=0). The following model was estimated:

Level 1:

$$Y_{ti} = \beta_{00} + \beta_{1i} M_{ti} + \beta_{20} M_{ti}^2 + \beta_{3i} S_{ti} + \beta_{40} O_{ti} + \varepsilon_{ti}$$

Level 2:

$$\beta_{1i} = \beta_{10} + r_{1i}$$

$$\beta_{3i} = \beta_{30} + r_{3i}$$

with β_{00} being an overall intercept, β_{1i} and β_{3i} are random subject-specific effects for respectively months (M_{ti}) and stimulation (S_{ti}), $\beta_{10,}$ $\beta_{20,}$ β_{30}, and β_{40} being fixed effects for respectively months(M_{ti}), the quadratic effect of months ($M_{ti}{}^2$), stimulation(S_{ti}), and operation/implantation of electrodes (O_{ti}). Finally, r_{1i} and r_{3i} are random subject effects that are assumed to be bivariate normally distributed with mean vector [0 0] and respectively variances σ^2_{r1i}

and σ^2_{r3i}, and covariance $\sigma_{r1i,r3i}$. Finally, ε_{ti} is an error-term that is normally distributed with ε_{ti} ~N(0, σ^2 ε_{ti}).

To examine the effect of predictors at baseline (e.g., depression at baseline), random-subject specific effects for months β_{1i} and stimulation β_{3i} are regressed on these predictors. Let P_i be the score of Subject i (e.g. a depression score) on Predictor P at baseline. Then, the following model was estimated:

Level 1:

$$Y_{ti} = \beta_{00} + \beta_{1i} M_{ti} + \beta_{20} M_{ti}^2 + \beta_{3i} S_{ti} + \beta_{4i} O_{ti} + \varepsilon_{ti}$$

Level 2:

$$\beta_{1i} = \beta_{10} + \Upsilon_1 P_i + r_{1i}$$

$$\beta_{3i} = \beta_{30} + \Upsilon_2 P_i + r_{3i}$$

with Υ_1 and Υ_2 being regression coefficients for predictor P_i.